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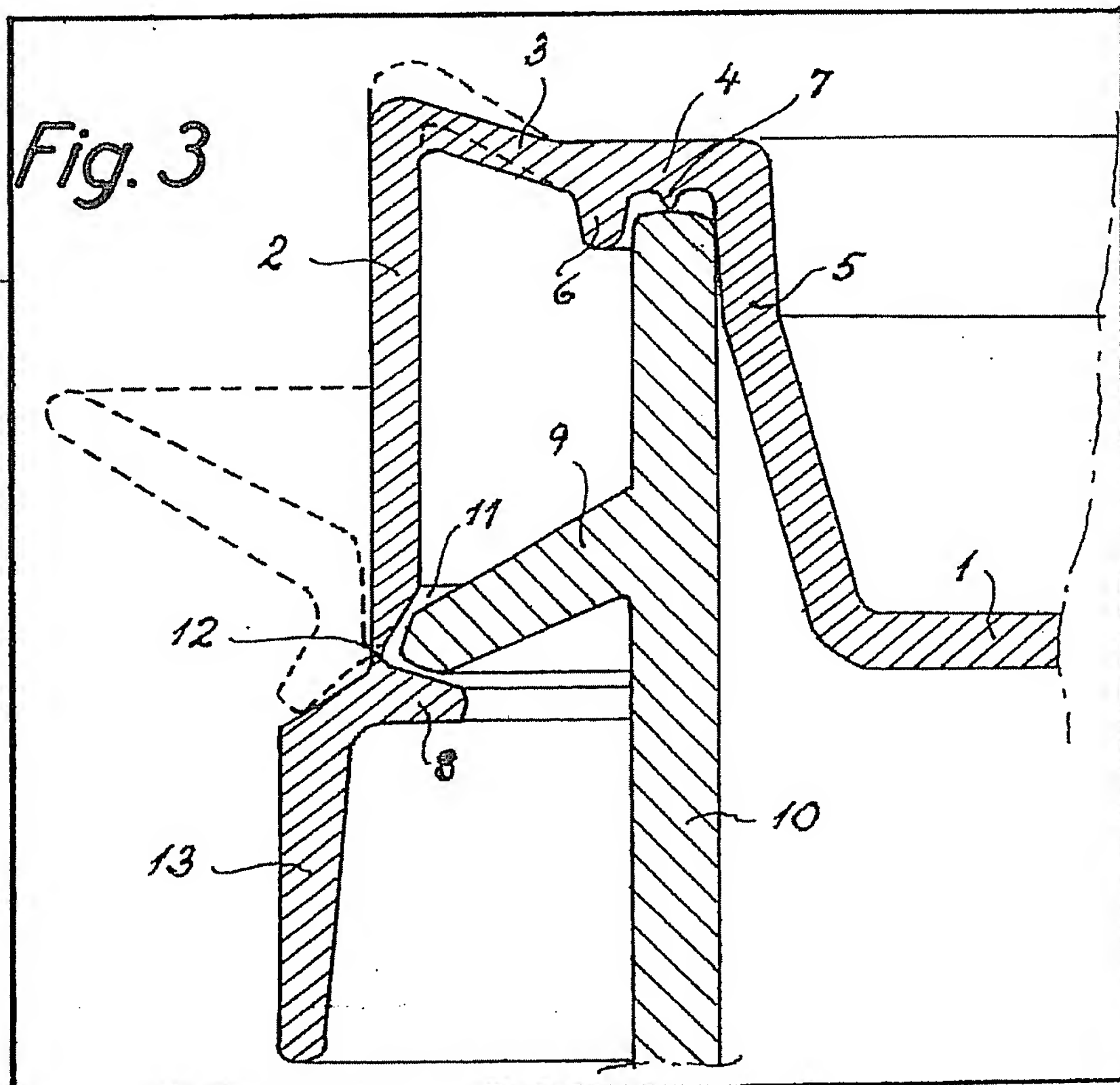
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 (71) Applicant
 Superfos A/S,
 Frydenlandsvej 30, DK-
 2950, Vedbaek, Denmark
 (72) Inventor
 H. Ole Willerup
 (74) Agents
 J. A. Kemp & Co.,
 14, South Square, Gray's
 Inn, London, WC1R 5EU

(54) Container Lid

(57) A container lid is provided with a lid flange 2 downwardly merging into a releasing flange 13 which from a position in which an inwardly extending snap rib 9 on said flange 2 engages a sealing edge on a container flange 9 or a container mouth bead is upwardly bendable to a position in

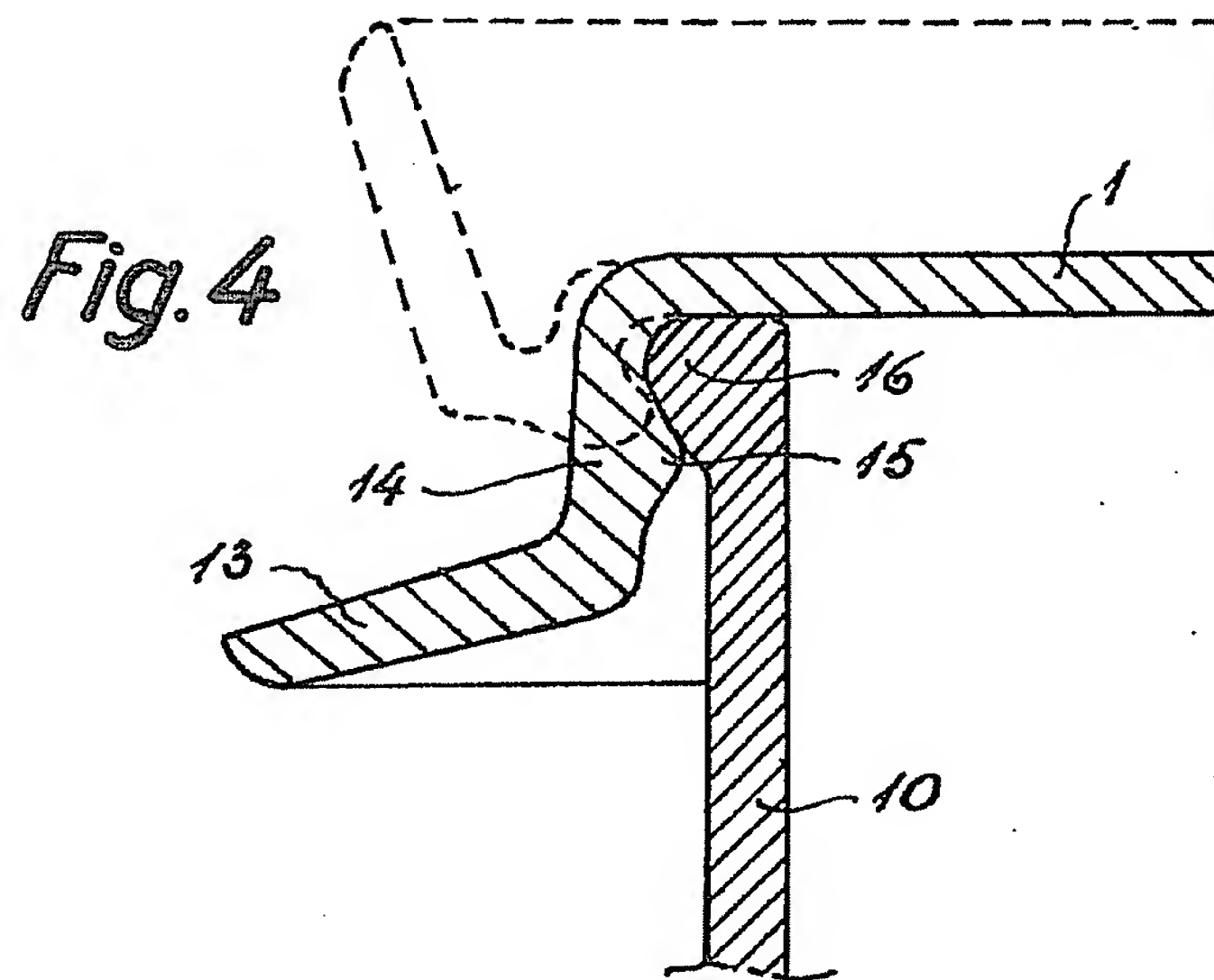
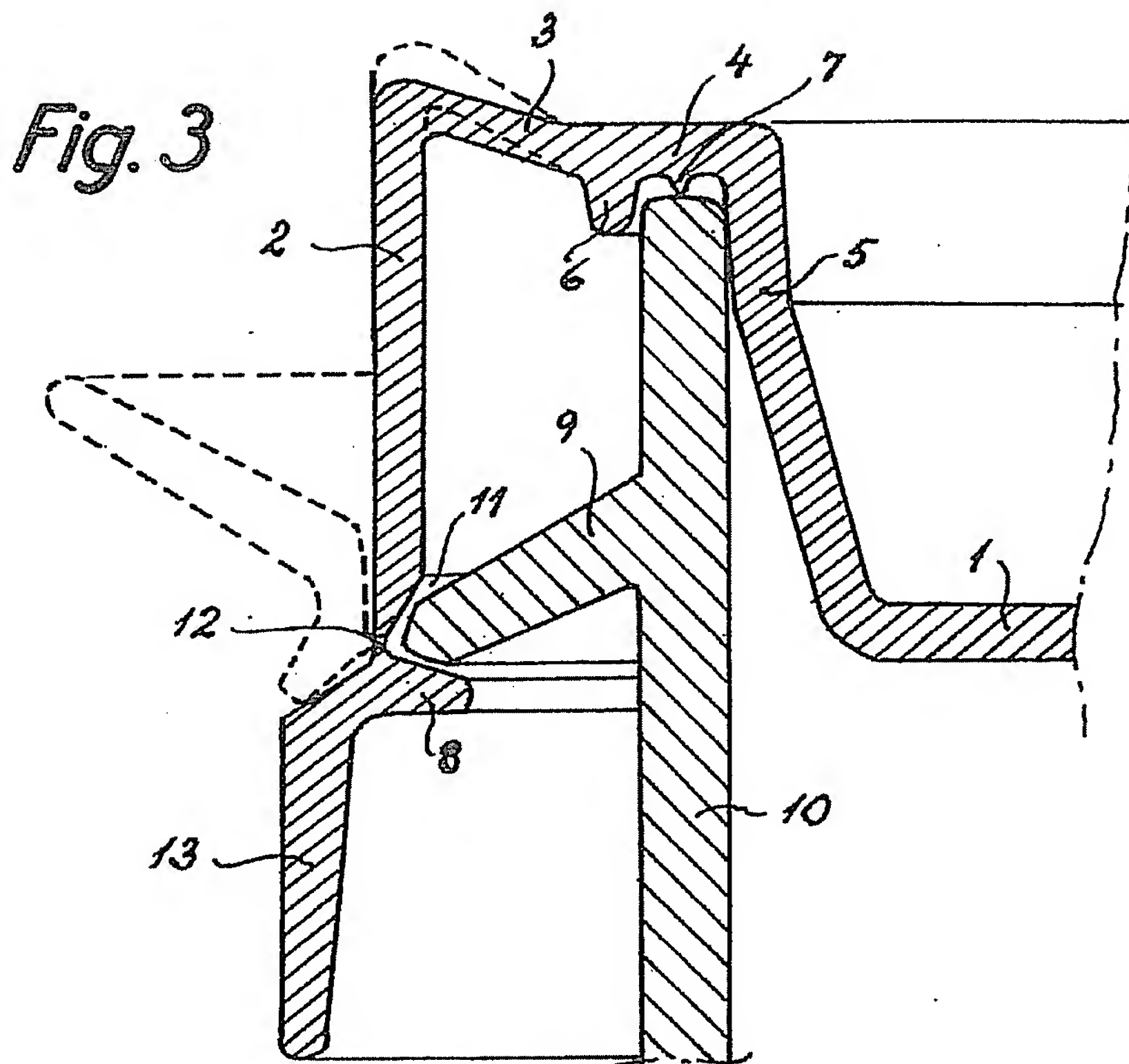
which said snap rib 8 goes clear of said container flange or abuts it at slight pressure. Releasing flange 13 acts as a bistable snap catch and is retained in its extreme positions by means of its inherent annular tension.

Releasing flange 13 causes even a large container lid seated firmly prestressed on a container to be readily removed, no tools being necessary.



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Fig. 2 is a cross-sectional view of a circular structure. It features a central core labeled 1. Surrounding the core is a thick, multi-layered ring. The layers are indicated by labels 3 and 4, which point to the outermost layers of the ring. The entire structure is depicted with multiple concentric lines representing the different layers.



SPECIFICATION Container Lid

The present invention relates to a container lid of a resiliently deformable plastic material, having
5 a downwardly extending lid flange provided with an inwardly extending annular snap rib engaging a peripheral bead or flange of a container to be sealed.

Lids of the type used as tight-sealing closures
10 for containers, e.g. paint buckets, are often difficult to remove because effective sealing implies powerful prestressing of the container lid material.

It is the object of the invention to facilitate
15 removal of tight container lids from containers and this is achieved by the fact that the lid flange adjacent to the snap rib merges into a peripheral releasing flange constituting a bistable snap catch, said releasing flange being bendable from a
20 downwardly extending position in which in tensioned condition it may abut a bead or a flange on the container, to an upwardly extending releasing position in which the snap rib goes clear of said container bead or flange or abuts the latter
25 at reduced tension.

The lid flange and the releasing flange constitute the links of a bistable toggle joint, the portion between said flanges constituting a hinge connection, and the annular tension of the
30 releasing flange acting as a spring which in the one position of the flange assists in keeping said snap rib and said container bead or flange firmly interengaged, and in the other position keeping the snap rib clear of or only in slight contact with
35 said container flange or bead. By moving his fingers along the lower side of the releasing flange, a person handling the container may readily bring the releasing flange past a bent position, in which the annular tension is at
40 maximum, thus enabling the releasing flange to snap up into its releasing position. The lid can now be easily removed, and when the container is in use the lid may be placed loosely thereon for temporary protection of its contents.

One embodiment of the container lid according
45 to the invention is characteristic by the provision of an annular recess on the inner wall of the lid flange, said recess widening conically downwards towards a thin bendable portion of said lid flange
50 directly above the snap rib. The embodiment is particularly suitable in connection with axially tensioned lids, the lower surface of the lid tightly abutting the mouth edge of the container along a narrow sealing line, the lid flange lying at a radial
55 distance outside of the container mouth and with a sharp bend merging into the lid surface proper without any possibility of transferring a bending momentum. A lid of the type just described is axially tensioned owing to the fact that the
60 distance between the edge of the container mouth and the under side of the container flange or bead is greater than the vertical distance between the sealing line of the lid and the top side of the snap rib on said lid flange of the

65 removed lid. Placing of the lid on the container generates a powerful axial tensile force in the lid flange, the tension being the higher the higher the required pressure is per unit of area at the sealing line between the container mouth and the lid.

70 Since the lid flange is only axially tensioned and thus only subjected to tensile force, the joint portion between the lid flange and the releasing flange may be relatively thin-walled, and thus bending the releasing flange from its one position
75 to the other practically only requires the maximum peripheral tension of the releasing flange to be overcome.

If container lids are to be sealed by means of axial tension only, it is of minor importance
80 whether the annular tension is greatest in the sealing position or in the releasing position of the releasing flange, and for this reason the releasing flange may extend substantially vertically downwards along the container wall so as to
85 avoid problems when a number of containers are positioned next to each other. Other types of containers, e.g. marmalade containers and the like having outwardly bulging side walls below the mouthrim of the container, may be provided
90 with a releasing flange having a diameter which in the sealing position of said flange is larger than in the releasing position of same, the annular tension of said flange then being higher in the sealing position, and this is of particular
95 importance in connection with lid types where a sealing between a bead at the container mouth and the container lid is based on radial prestressing.

The invention will now be described in more
100 detail with reference being had to the drawing.

Fig. 1 is a radial sectional view of an embodiment of the lid according to the invention.

Fig. 2 is a top plan view of said lid,

Fig. 3 is a sectional view of a preferred,
105 embodiment of the container lid according to the inventions, and

Fig. 4 is a corresponding sectional view of another embodiment of the container lid according to the invention.

110 The container lid shown in Figs. 1 to 3 has a plane surface 1 and a substantially axial—and when in use—downwardly extending flange 2 which via a conical rim portion 3 merges into a radial flange portion 4 connected to the plane lid
115 surface 1 through a substantially axial inner flange portion 5. The lower surface of the radial flange portion 4 is provided with an axial guide rib 6 and a sharp sealing rib 7 abutting the edge of a container mouth along a narrow sealing line.
120 When the container is tightly sealed a snap rib 8 on the inner side of the lid flange 2 abuts a downwardly extending locking edge at the extremity of a container flange 9 extending from the container wall 10. Fig. 3 shows—in dotted
125 lines—the position of the conical rim portion 3 when the lid is loosely seated on the container. In this position the vertical distance from the container mouth edge to the downwardly extending locking edge of the container flange 9

is greater than the vertical distance from the sealing rib 7 to the top of the snap rib 8. When the lid is tightly seated on the container the conical rim portion 3 is pressed down—shown in full lines—by means of axial pressure, the snap rib 8 thus engaging the locking edge of the container flange 9. The lid flange 2 is thus subjected to axial tensile force causing the sealing rib 7 to be powerfully pressed against the container mouth.

Immediately above the snap rib 8 lid flange 2 is provided with an annular recess 11 and merges via a thin-walled portion 12 into a releasing flange 13 which in its sealing position extends downwardly as shown.

When a container user wishes to remove the lid, he moves his fingers along the lower surface of the sealing flange 13, exerting an outwardly ascending pressure thus increasing the annular tension to maximum so that the flange suddenly snaps upwards into its upper position shown in dotted lines, in which the snap rib 8 goes clear of the container flange 9. The releasing flange 13 thus acts as a bistable toggle joint along the thinwalled portion 12 hingedly connected to lid flange 2 and retained in its extreme positions by means of the annular tension of the flange. When the releasing flange 13 is so shaped that in sealing position it extends further out from the container wall in radial direction, the increased annular tension will cause a still firmer interengagement of the snap rib 8 and the container flange 9.

This is of special advantages when the sealing of the lid to the container mouth is achieved by means of radial tensile force of the lid as is the case according to the embodiment shown in Fig. 4. Here the plane surface 1 of the lid merges directly into an axial lid flange 14 which is at its inner surface provided with an annular sealing rib or bead 15 which in the sealing position of the lid engages a container mouth bead 16 at the top of the container wall 10. The diameter of the releasing flange 13 is—as shown—in the closed position of said flange larger than in the releasing position thereof, the sealing rib 14 in closed position thus being powerfully pressed around the bead 16, whereas rib 14, when the releasing flange is in its upper position (shown in dotted lines) goes substantially clear of bead 16. In releasing position the sealing rib 14 and the container mouth bead 16 may remain interengaged, but at slighter pressure so as to enable the sealing rib to readily pass bead 16

when the lid is being removed.

It is not absolutely necessary to let the sealing rib of the embodiment shown in Fig. 3 go completely clear of the container flange 9 during removal of or replacing the lid on the container. The container lid according to the invention with its bistable snap catch releasing flange may be differently shaped from the embodiments shown on the drawing. In particular the periphery of the lid may be regularly polygonal with rounded corners, so as to be suited for corresponding polygonal containers, like containers for the storage of food, lunch boxes, food buckets and the like.

Claims

1. A container lid of a resilient deformable plastic material, having a downwardly extending lid flange (2) provided with an inner annular snap rib (8) engaging a peripheral bead (16) or a flange (9) on a container to be closed, *characterized* by said lid flange (2) adjacent to said snap rib (8) merging into an annular releasing flange (13) which constitutes a bistable snap catch, said flange (13) being bendable from a downwardly extending position in which in tensioned condition the snap rib (8) may abut container bead (16) or flange (9), to an upwardly extending position in which the snap rib goes clear of the container bead or flange or abuts the latter at a reduced tension.

2. A container lid according to claim 1, *characterized* by the provision of an annular recess (11) in the inner wall of the lid flange (2) above the snap rib (8), said recess (11) widening conically downwards to a thin resilient portion (12) of said lid flange directly above said snap rib (8).

3. A container lid according to claims 1 or 2, *characterized* by the fact that the releasing flange (13) has a diameter being larger in the sealing position of said flange than in the releasing position thereof.

4. A container lid according to claim 1 or 2, *characterized* by the fact that the releasing flange (13) is shaped so as to extend substantially axially when in its sealing position.

5. A container lid constructed and arranged substantially as hereinbefore described with reference to and as illustrated in Figures 1 and 2 or Figure 3 or Figure 4 of the accompanying drawings.